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**ABSTRACT OF THE DISCLOSURE**

A system for estimating the transfer function of a transmission channel such as the downlink channel in a CDMA system over which a pilot signal and a data signal are transmitted. The system includes at least one estimator for producing first and second channel estimates from the pilot signal and the data signals and a combination node for combining the first and second channel estimates to obtain final combined channel estimates. The system includes an interpolator module adapted for interpolating the second channel estimates over a basic estimation reference time to produce equal numbers of channel estimates over the basic estimation reference time derived from the data signal and the pilot signal respectively, and possibly rate adaptation modules adapted for mapping the channel estimates on the basic estimation reference time. The combination node is a summation node producing the final combined channel estimates as a sum of the first channel estimates and the interpolated second channel estimates.